Research in Learning Technology
Vol. 31, 2023

ASSOCIATION FOR LEARNING TECHNOLOGY

ALT

ORIGINAL RESEARCH ARTICLE

Developing resilience online: Evaluation of synchronous and asynchronous resilience interventions for Filipino college students

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(Received: 11 September 2022; Accepted: 12 November 2022; Published: 24 February 2023)

This study evaluated two forms of a resilience intervention amongst college students during the COVID-19 pandemic. Utilising a randomised controlled trial design, it examined the impact of a synchronous and asynchronous resilience interventions versus a control group that did a journaling intervention. Outcomes measured included coping behaviour, non-reactivity, wellbeing, stress, depression and anxiety. Participants consisted of Filipino college students randomly assigned to three groups: synchronous online resilience group (n = 135), asynchronous resilience group (n = 121) and control group (n = 127). Results revealed that students who went through the online synchronous resilience reported a significant reduction in depression at post-intervention compared to those who went through an asynchronous intervention. Post-intervention scores for nonreactivity were also higher in the synchronous group compared to both asynchronous and journaling groups. Effect sizes were small to moderate. This study suggests that online resilience interventions are viable means to address the mental health needs of students, especially in countries with limited mental health resources.

Keywords: resilience; mental health; MHPSS; pandemic; well-being; depression; Philippines

The COVID-19 pandemic has brought about a plethora of mental health outcomes. Issues of physical safety coupled with the lack of social support due to physical distancing regulations gave rise to emotional distress, fear, helplessness, anxiety, grief and sorrow (Soklaridis *et al*. 2020). Beyond social distancing and isolation, fear of infection and death led to anger, confusion and post-traumatic distress (Mukhtar 2020).

This research was supported by a grant from the University Research Council of the Ateneo de Manila University.

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Citation: Research in Learning Technology 2023, **31**: 2890 - http://dx.doi.org/10.25304/rlt.v31.2890

Although many groups have been affected, the youth appear to be particularly at risk. Prolonged school closure, isolation from peers and economic difficulties appear to have led to disturbances in sleep and exercise routines and have led to excessive use of technology. A meta-analysis of 23 studies amongst the youth revealed that 29% reported depressive symptoms, 26% reported anxiety symptoms, 44% had sleep disorders and 48% reported post-traumatic stress symptoms (Ma *et al*. 2021). Similarly, a study on the impact of the COVID-19 pandemic amongst Filipino youth reported greater symptoms of depression, anxiety and stress and lower well-being compared to older respondents (Hechanova, Valentin, and Alampay 2022). The authors suggested that this can be attributed to a still-developing brain and the youth's limited ability to communicate their feelings, lifestyle and inadequate coping strategies. Imran, Zeshan and Pervaiz (2020) suggest the need to improve the ability of the young to express their fears and concerns and need to encourage helpful routines and physical activities.

The past decade has seen a rise in tele-mental health interventions. There is evidence that tele-mental health services improve access and provide flexibility in interactions between clients and their service providers. Tele-mental health also reduces the cost of services and, as such, is advantageous for countries with limited access to mental health services. Unfortunately, much of the evidence on tele-mental health services have come from developed economies, and there is a dearth of research from non-Western and developing economies such as the Philippines. In addition, although there have been studies comparing different modalities of tele-mental health interventions, they have mostly utilised adult samples. This study seeks to fill these gaps by examining the impact of online resilience interventions for Filipino young adults.

Resilience and tele-mental health interventions

Luthar and Cicchetti (2000) define resilience has been defined as 'the ability of individuals to display positive adaptation despite the experiences of significant adversity or trauma'. Rather than merely being a personal trait, they describe resilience as a social competence that can be learned. This perspective has given rise to various resilience interventions. A meta-analysis of resilience interventions suggests that they generally consist of cognitive behavioural therapy, mindfulness and a combination thereof (Joyce *et al*. 2018).

Although a vast majority of resilience interventions are delivered via face-to-face, innovative approaches such as bibliotherapy, online webinars or phone coaching are also being used (Joyce *et al*. 2018). A meta-analysis of 64 trials examining Internet-delivered Cognitive Behavioural Therapy modules or lessons reported positive benefits for those with major depression, panic disorder, social anxiety disorder or generalised anxiety disorder (Andrews *et al*. 2010).

The COVID-19 pandemic increased the provision of tele-mental health services by paraprofessionals. In China, nurses conducted 10-min WeChat consultations twice daily to COVID-19 patients with elevated anxiety and depression scores. Results revealed improvements in anxiety and depression of patients (Zhou *et al*. 2020). Another study found improvements in sleep and anxiety of COVID-19 patients who were provided progressive muscle relaxation intervention audio (Liu *et al*. 2020). A similar study provided audio-recordings on relaxation, mindfulness and bilateral stimulation through patients' mobile phones every day for 2 weeks. Those who went through the intervention reported reduced anxiety symptoms compared to those who did not (Wei *et al*. 2020). Tele-mental health interventions were also delivered to health

Citation: Research in Learning Technology 2023, **31**: 2890 - http://dx.doi.org/10.25304/rlt.v31.2890

workers in self-isolation in Italy (Giordano *et al*. 2020). A music therapy intervention consisting of a playlist that focused on breathing, energy and serenity was delivered using mobile phones. Results reported reduced levels of tiredness, sadness, fear and worry amongst healthcare workers.

Beyond patients and health workers, the increased mental health concerns of adolescents also gave rise to the delivery of mental health support using educational platforms. For example, a brief Acceptance Commitment Therapy psychoeducation was delivered via videoconferencing (Zoom) to undergraduates in the United States. The four-session intervention was delivered as part of a psychology seminar course. Pre- and posttests showed that stress and anxiety decreased at follow-up. Students reported the intervention as helpful and accessible and reported moderate engagement with skills outside of class (Browning *et al*. 2022).

There have been a few studies comparing synchronous and asynchronous interventions with mixed findings. Aller *et al*. (2022) compared the effectiveness of mental health literacy delivered as an online asynchronous course and as in-person workshop compared to a control group. This quasi-experimental study included 1049 undergraduate students who self-selected enrolment in a Mental Health Awareness and Advocacy (MHAA) course (treatment; $n = 474$) or a general lifespan development course (comparison; $n = 575$). Students in the treatment group significantly increased their mental health literacy knowledge and self-efficacy compared to the control group. Treatment effects did not differ across modalities, suggesting that students' mental health literacy improved regardless of whether it was developed synchronously or asynchronously. On the other hand, a study compared synchronous online community mental health groups with asynchronous forum-based online mental health groups. The study reported that synchronous groups were more cohesive than asynchronous groups (Li, Kraut, and Zhu 2021).

The majority of the studies on tele-mental health have emanated from developed economies, and there is a dearth of studies from low resource countries (Constantine 2002). As such, this study seeks to contribute to the literature by evaluating a synchronous and asynchronous delivery of an online resilience intervention created for Filipinos.

Katatagan resilience intervention

This study examines a resilience intervention named *Katatagan*,[1] which was designed to develop resilience skills using principles and strategies from Positive Psychology, Cognitive Behaviour Therapy and Mindfulness. It consists of six modules with each module developing a resilience skill. Module 1 aims to encourage participants' self-efficacy and address their sense of helplessness by asking them to reflect on their internal and external sources of strength. Module 2 seeks to help participants manage their somatic reactions using techniques such as progressive muscle relaxation, bioenergetic exercises and emotional freedom technique. Module 3 aims to help participants deal with their negative thoughts and emotions using cognitive reframing and thought substitution strategies. Module 4 focuses on routines and activities that can improve mood. Module 5 seeks to build problem-solving skills and encourage participants to seek social support in solving their problems. Module 6 focuses on encouraging meaning making and invites participants to set goals for the future. Mindfulness was developed throughout the program by introducing it as a centring exercise at the

[1]Filipino term meaning resilience.

beginning of each module. Given the collective nature of Filipinos, the intervention was implemented in small groups (Hechanova *et al*. 2015).

The *Katatagan* program was first implemented amongst college student survivors of Supertyphoon Haiyan in 2014. The pilot-test found students who participated in the program reported less anxiety and depressive symptoms and improved coping behaviours (Hechanova *et al*. 2015). Another longitudinal study reported increased self-efficacy on resilience skills 6 months after the program (Hechanova, Waelde, and Ramos 2016). The program was also implemented amongst displaced survivors, and participants reported decreased anxiety and increased resilience scores compared to non-participants (Hechanova *et al*. 2018).

During the COVID-19 pandemic, *Katatagan* was adapted for online delivery in two modalities: synchronous resilience classes and asynchronous self-paced classes. This study sought to evaluate the outcomes of these two versions of the resilience program compared to a control group. Specifically, we asked:

(1) To what extent would the synchronous and asynchronous resilience intervention improve psychological well-being and adaptive coping skills compared to a control group?
(2) To what extent would the synchronous and asynchronous intervention decrease stress, anxiety and depression symptoms of participants compared to a control group?
(3) Would there be differences in the impact of synchronous and asynchronous resilience interventions?

Methods

This study utilised a randomised controlled trial design comparing three groups – a synchronous resilience group, an asynchronous resilience group and a control group that did journal writing.

Sample

Participants were recruited through convenience sampling via social media using the following inclusion criteria: students currently enrolled in any college or university in the Philippines; aged 18 to 25 years old; do not have any diagnosed or underlying mental health condition; have not attended any previous *Katatagan* Online program; and have adequate Internet connection. Figure 1 summarises the participant flow from enrolment to data analysis. A total of 482 participants were assessed for eligibility to participate in the study; however, 99 participants were excluded before randomisation as they declined to participate (n = 95) and decided to withdraw from the study (n = 4). Of the 383 participants, 135 were allocated to the synchronous resilience classes (i.e. Condition 1), 121 were assigned to the asynchronous self-paced classes (i.e. Condition 2) and 127 participants were allocated to the journal writing activity (i.e. Condition 3).

Participants were between the ages of 18 and 25 years old (M = 20.85, standard deviation [SD] = 1.27), with the majority of them being female (78.6%). Other baseline characteristics of participants across three conditions can be found in Table 1.

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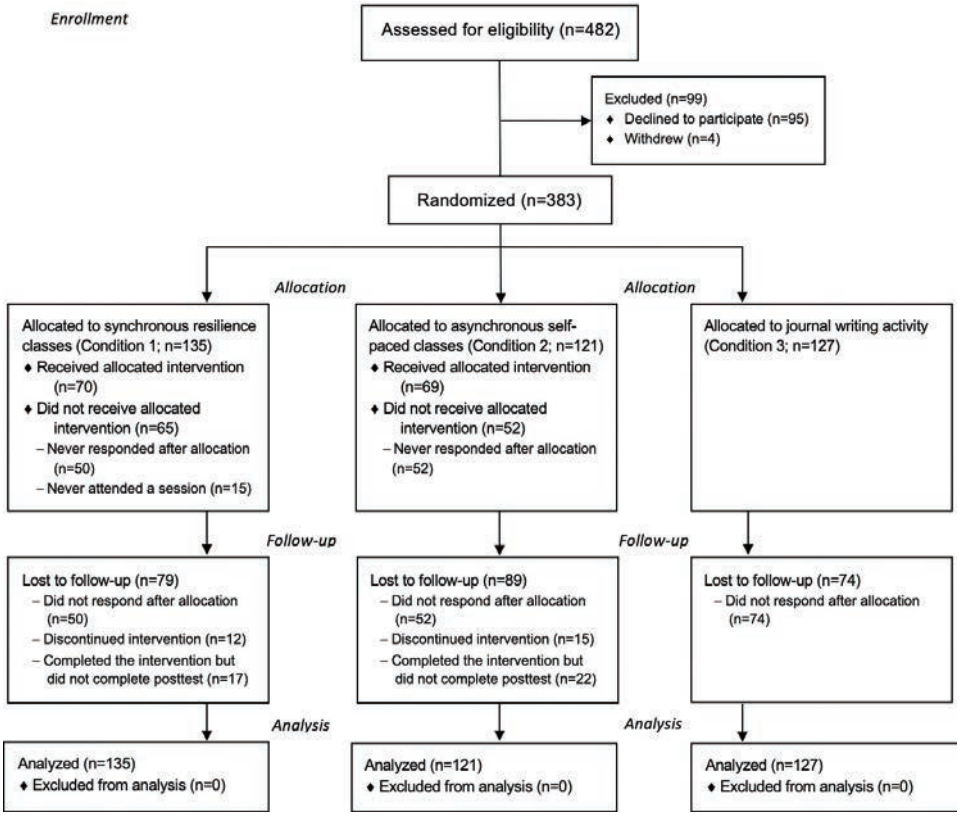

Figure 1. CONSORT 2010 flow diagram for KO RCT.

Intervention

The synchronous resilience intervention was run in small groups (of no more than 12 participants). The sessions were conducted with two facilitators and ran for 1.5 to 2 h depending on the size of the group. The intervention ran for 6 weeks with one module per week. Facilitators consisted of trained paraprofessionals with behavioural science backgrounds and previous experience in facilitating group interventions. Facilitators were also trained on the use of Zoom and ethics in the delivery of tele-mental health services.

In the asynchronous version of the program, participants enrolled in an online course on Canvas. The online course consisted of the six modules. Each module featured videos, reflection questions and a facilitated discussion board. Participants were given 6 weeks to finish the online course.

The control group was given journaling exercise consisting of six weekly prompts sent via email. The self-help prompts instructed them to write about the highlights of their week and their reactions to these.

Measures

Psychological well-being was assessed through WHO-5 Well-being Index (World Health Organization 1998), a 5-item survey. A 6-point Likert scale was used (0 = *at no*

Table 1. Baseline characteristics of participants in the three conditions.

Demographic variable	Synchronous (n = 135)	Asynchronous (n = 121)	Control/journaling (n = 127)	Total (N = 383)
Female, n (%)	107 (79.3%)	95 (78.5%)	99 (78.0%)	301 (78.6%)
Age, M (SD)	20.95 (1.34)	20.73 (1.19)	20.85 (1.25)	20.85 (1.27)
Region, n (%)				
NCR	21 (15.6%)	17 (14.0%)	24 (18.9%)	62 (16.2%)
CAR	8 (5.9%)	2 (1.7%)	6 (4.7%)	16 (4.2%)
Region I	14 (10.4%)	12 (9.9%)	14 (11.0%)	40 (10.4%)
Region II	0 (0.0%)	0 (0.0%)	3 (2.4%)	3 (0.8%)
Region III	28 (20.7%)	18 (14.9%)	12 (9.4%)	58 (15.1%)
Region IVA	12 (8.9%)	10 (8.3%)	11 (8.7%)	33 (8.6%)
Region V	3 (2.2%)	5 (4.1%)	3 (2.4%)	11 (2.9%)
Region VI	2 (1.5%)	2 (1.7%)	3 (2.4%)	7 (1.8%)
Region VII	1 (0.7%)	6 (5.0%)	0 (0.0%)	7 (1.8%)
Region VIII	2 (1.5%)	0 (0.0%)	2 (1.6%)	4 (1.0%)
Region IX	2 (1.5%)	3 (2.5%)	5 (3.9%)	10 (2.6%)
Region X	40 (29.6%)	44 (36.4%)	39 (30.7%)	123 (32.1%)
Region XI	1 (0.7%)	0 (0.0%)	2 (1.6%)	3 (0.8%)
Region XII	0 (0.0%)	1 (0.8%)	0 (0.0%)	1 (0.3%)
Region XIII	1 (0.7%)	0 (0.0%)	2 (1.6%)	3 (0.8%)
BARMM	0 (0.0%)	1 (0.8%)	1 (0.8%)	2 (0.5%)

Note. SD = standard deviation; NCR = National Capital Region; CAR = Cordillera Administrative Region; BARMM = Bangsamoro Autonomous Region in Muslim Mindanao.

time, 5 = *all of the time*). Sample items are 'I have felt cheerful and in good spirits' and 'I have felt calm and relaxed'. Reliability of the scale was 0.92.

Stress, anxiety and depression were measured using the DASS-21 Scale (Antony *et al*. 1998). The 21-item scales utilised a 4-point Likert scale (0 = *did not apply to me at all*; 3 = *applied to me very much, or most of the time*) and includes items measuring depression ('I felt I had nothing to look forward to'), anxiety ('I experienced difficulty breathing') and stress ('I found it difficult to relax'). Reliabilities of the subscales were 0.88 (depression), 0.82 (anxiety) and 0.86 (stress).

Non-reactivity was measured using the Five Factor Mindfulness Questionnaire – Nonreactivity subscale (Baer *et al*. 2006). The 7-item survey uses a 5-point Likert scale rated from 1 (*never or very rarely true*) to 5 (*very often or always true*). The internal reliability of the scale was 0.86.

Adaptive coping was assessed using an 18-item abridged version of Carver's (1997) Brief COPE Scale. It included two items each from the following domains: active coping (α = 0.67), use of emotional support (α = 0.77), use of instrumental support (α = 0.81), planning (α = 0.68), positive reframing (α = 0.72), religious coping (α = 0.84) and behavioural disengagement (α = 0.77). The measure utilised a 4-point Likert scale (1 = *I haven't been doing this at all*, 4 = *I've been doing this a lot*). Sample items are 'I have been getting emotional support from others' and 'I've been concentrating my efforts on doing something about the situation I'm in'.

Citation: Research in Learning Technology 2023, **31**: 2890 - http://dx.doi.org/10.25304/rlt.v31.2890

Procedures and Ethics

Ethics approval was obtained from the Ateneo de Manila University institutional research ethics board. Publicity material to invite potential participants to join the research was published through the official social media account of *Katatagan* Online. Research participants were recruited from the pool of individuals who voluntarily enrolled in the *Katatagan* Online program from September 1 to October 12, 2022. The registration link to the study was provided in the recruitment poster, where potential participants read the online informed consent form and expressed their consent digitally by clicking a button on Google Forms. Those who did not wish to participate also clicked on a button, signifying that they do not wish to participate in the study.

Consenting participants were directed to answer the pretest online questionnaire. An assigned officer from the *Katatagan* Online program team who is external to the research team randomly assigned participants to one of three conditions: (1) synchronous resilience classes, (2) asynchronous self-paced classes and (3) journal writing activity. Randomisation was done using a simple randomisation technique that followed a 2-1-3 sequence to the list of participants who signed up for the study.

After enrolling in the program, participants were provided the informed consent form, and those who consented to be part of the study were led to the online pretest survey. All the three groups were given 6 weeks after which participants were invited to answer a posttest survey. Confidentiality and privacy were ensured through the removal of identifying information and the use of password protected computer files.

Data analysis

At posttest, 37% of the initial respondents had complete data, with a large proportion not responding after being randomised to one of the three conditions (Figure 1). Attrition analyses showed that participants who had complete data were slightly older, had lower baseline depressive symptoms and had higher baseline nonreactivity and active coping scores compared to those who did not complete the posttest. To reduce bias due to the high attrition rate, the analyses followed an intention-to-treat approach in which all participants who were randomised were analysed in their allocated group regardless of program attendance or completion. Missing data were handled using full information maximum likelihood in Mplus 8 (Muthén and Muthén 1998–2017).

Data analysis was conducted by a statistician blind to participants' allocation to the three conditions. First, intraclass correlation coefficients (ICCs) and design effect estimates were computed to determine the need to conduct a nested analysis that would account for participant groupings (facilitators and school). Linear regression analyses were conducted to examine intervention effects on posttest scores controlling for baseline scores using maximum likelihood estimation with robust standard errors (MLR) to account for skewed variables. Two sets of analyses were conducted: one comparing post outcomes across conditions with the journaling condition as the reference group, and one comparing outcomes with the synchronous condition as the reference group. Analyses used TYPE=COMPLEX and CLUSTER to correct for non-independence of observations within schools. Effect sizes were estimated to compare posttest scores across groups. Finally, sensitivity analyses were conducted using complete cases to determine the robustness of the results to the missing data handling strategy.

Table 2. Pre- and postscores on study outcomes by condition.

Outcome	Synchronous (n = 135)		Asynchronous (n = 121)		Control/journaling (n = 127)	
	M	SD	*M*	SD	*M*	SD
Psychological well-being						
Pre	13.09	5.44	12.55	5.97	13.55	5.75
Post	16.79	5.92	14.50	6.63	15.23	5.77
Depression						
Pre	8.14	4.99	7.88	4.84	6.93	4.74
Post	5.05	4.15	6.53	4.77	6.07	4.64
Anxiety						
Pre	7.76	4.64	7.30	4.44	6.72	4.52
Post	6.34	5.05	6.91	4.39	6.96	5.05
Stress						
Pre	9.19	4.45	8.61	4.91	7.90	4.58
Post	6.64	4.55	7.66	4.12	7.98	4.68
Nonreactivity						
Pre	20.82	5.75	20.57	6.05	21.30	5.79
Post	24.73	6.19	22.50	5.43	22.72	4.76
Instrumental support seeking						
Pre	1.15	0.91	1.14	0.89	1.06	0.94
Post	1.53	0.88	1.36	0.90	1.41	0.96
Emotional support seeking						
Pre	1.81	0.82	1.75	0.81	1.79	0.86
Post	2.19	0.77	2.12	0.74	2.07	0.80
Active coping						
Pre	2.10	0.73	2.00	0.75	2.01	0.72
Post	2.35	0.56	2.42	0.52	2.32	0.68
Planning						
Pre	2.15	0.70	2.14	0.70	2.15	0.70
Post	2.37	0.66	2.39	0.59	2.24	0.62
Behavioural disengagement						
Pre	0.94	0.87	0.71	0.75	0.68	0.78
Post	0.63	0.72	0.66	0.63	0.76	0.89
Positive reframing						
Pre	1.94	0.76	2.06	0.79	1.95	0.74
Post	2.31	0.63	2.37	0.57	2.11	0.75
Religious coping						
Pre	1.52	1.00	1.72	1.00	1.62	0.96
Post	1.70	0.93	2.08	0.93	1.74	0.93

SD = standard deviation.

Results

Because participants came from different schools and were assigned to different facilitators, design effect estimates were computed to determine if a nested analysis is necessary. Researchers note that design effect estimates greater than 2 indicate the need for multilevel models (Muthen and Satorra 1995; Peugh 2010). At the facilitator level, none of the design effects was greater than 2. At the school level, the design effect was

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Table 3. Linear regression and effect size estimates comparing posttest scores across conditions.

Outcome	Synchronous vs. journaling				Asynchronous vs. journaling				Synchronous vs. asynchronous			
	B	SE	β	*d* [95%CI]	*B*	SE	β	*d* [95%CI]	*B*	SE	β	*d* [95%CI]
Psychological well-being	1.55	0.68	0.12	0.24 [0.01, 0.49]	−0.62	1.34	−0.05	−0.10 [−0.35, 0.15]	2.17	1.24	0.17	0.34 [0.10, 0.59]
Depression	−1.28	0.71	−0.14	−0.28 [−0.53, −0.04]	0.68	0.78	0.07	0.14 [−0.11, 0.39]	−1.96**	0.75	−0.20	−0.41 [−0.66, −0.16]
Anxiety	−0.79	0.77	−0.08	−0.16 [−0.40, 0.08]	0.13	0.90	0.01	0.02 [−0.23, 0.27]	−0.92	0.89	−0.09	−0.18 [−0.43, 0.06]
Stress	−1.44	0.81	−0.15	−0.30 [−0.55, −0.06]	−0.04	0.90	−0.00	−0.01 [−0.26, 0.24]	−1.40	0.85	−0.14	0.28 [−0.53, −0.04]
Nonreactivity	1.88*	0.96	0.16	0.33 [0.08, 0.57]	−0.71	0.99	−0.06	−0.12 [−0.37, 0.13]	2.59*	1.07	0.22	0.45 [0.29, 0.70]
Instrumental support use	0.09	0.11	0.07	0.14 [−0.10, 0.38]	−0.11	0.17	−0.06	−0.12 [−0.37, 0.13]	−0.01	0.11	−0.01	−0.02 [−0.27, 0.23]
Emotional support use	0.10	0.14	0.06	0.12 [−0.12, 0.36]	0.05	0.16	0.03	0.06[−0.19, 0.31]	0.05	0.15	0.03	0.06 [−0.19, 0.31]
Active coping	−0.06	0.11	−0.04	−0.08 [−0.32, 0.16]	0.07	0.11	0.05	0.10 [−0.15, 0.35]	−0.12	0.11	−0.09	−0.18 [−0.43, 0.06]
Planning	0.11	0.11	0.08	0.16 [−0.08, 0.40]	0.12	0.12	0.09	0.18 [−0.07, 0.43]	−0.01	0.12	−0.01	−0.02 [−0.26, 0.23]
Behavioural disengagement[1]	−0.26	0.14	−0.16	0.33 [0.08, 0.57]	−0.12	0.13	−0.07	−0.14 [−0.39, 0.11]	−0.14	0.12	−0.08	−0.16 [−0.41, 0.08]
Positive reframing	0.21	0.12	0.15	0.30 [0.06, 0.55]	0.14	0.12	0.10	0.20 [−0.05,0.45]	0.07	0.11	0.05	0.10 [−0.15, 0.35]
Religious coping	−0.03	0.12	−0.02	−0.04 [−0.28, 0.20]	0.13	0.14	0.06	0.12 [−0.13, 0.37]	−0.16	0.15	−0.08	0.16 [−0.41, 0.08]

Note. All analyses controlled for pretest scores.
SD = standard deviation; SE = standard error; CI = confidence interval.
[1]Analyses used TYPE = COMPLEX and CLUSTER commands to correct for nonindependence of observations within schools.
*$p < 0.05$, ** $p < 0.01$.

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2.05 for behavioural disengagement. We, thus, accounted for school clustering for the analysis of this variable.

Table 2 presents a summary of pre and post scores on the primary outcomes across the synchronous, asynchronous and journaling conditions. Table 3 presents the results of linear regression analyses comparing posttest scores across the three conditions, controlling for pretest scores. Results showed a significant difference between the synchronous and asynchronous groups on depression symptoms (Table 3). There was also a significant difference between the synchronous and both asynchronous and journaling groups on non-reactivity. Specifically, posttest depression scores were significantly lower amongst synchronous participants compared to asynchronous participants, and non-reactivity scores were significantly higher amongst synchronous participants compared to both asynchronous and journaling participants (Table 2). In contrast, there were no significant differences between the asynchronous and journaling conditions on any of the outcomes. The effect sizes of the comparisons were small to moderate (Table 3). Sensitivity analyses using data with complete cases showed similar findings, suggesting that results are robust to the missing data handling strategy.

Discussion

Amongst the three groups included in this study, those who participated in the synchronous *Katatagan* Online program evidenced better outcomes on depression and non-reactivity than those who participated in the asynchronous and the journaling conditions. This appears to run contrary to Aller *et al*.'s (2022) study that suggests that both synchronous and asynchronous interventions have the same effects. Similarly, an earlier study that used a less robust pretest–posttest design also found small to medium effect sizes on wellbeing and resiliency amongst participants who underwent the asynchronous *Katatagan* Online program (Hechanova *et al*. 2022).

However, the results are consistent with a meta-analysis of Randomized Control Trial (RCTs) involving online resiliency programs which showed similar small effect sizes, and a relatively larger effect size amongst synchronous programs compared to asynchronous ones (Ang *et al*. 2022). One explanation for why the synchronous programs could have yielded better outcomes is because they are more comparable to face-to-face treatment (Andrews *et al*. 2018) that provides real time conversations (Blau, Weiser, and Eshet-Alkalai 2017). There is evidence that social support enables psychological resilience (Sassaki *et al*. 2019) and synchronous groups provide that. These synchronous groups may have provided the social contact that the youth participants craved, given that many schools were still closed to on-site schooling at the time of this study.

The results may also reflect the collectivist nature of Filipinos. Haque (2010) suggests that those in collectivist cultures derive their resilience from their support groups. This was validated by a study that Filipino disaster survivors tend to cite external sources of strength such as family and friends and God (Hechanova *et al*. 2015). A pilot study on *Katatagan Online* reports that talking to people who shared similar experiences, thoughts and emotions was validating for them because they felt that they were not alone (Hechanova *et al*. 2022).

In contrast to synchronous groups, those in the asynchronous condition may have felt less connected to their cohorts. This is suggested by Li, Kraut and Zhu (2021) who reported that synchronous online community mental health groups are more cohesive than asynchronous forum-based online mental health groups. The researchers

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suggested that technical features of different online community platforms affect community cohesion, and that speed and evenness of communication are as important as the frequency of communication.

Examination of descriptive statistics shows an improvement from pretest to posttest across most, if not all, coping sub-sales. However, the changes were not statistically significant. This is contrary to an earlier study on the asynchronous *Katatagan* Online program that found a significant increase in seeking emotional and instrumental support and active coping strategies (Hechanova *et al*. 2022). As the synchronous online intervention had a significant impact on the participants' wellbeing, this finding may suggest that the meetings themselves were helpful in bringing about greater wellbeing and lower depression even with slight changes in coping behaviours.

Similar to the findings of the asynchronous *Katatagan* Online study (Hechanova *et al*. 2022), although the scores on stress and anxiety were slightly lower post-program, the change was not significant. Scores in wellbeing were likewise non-significant albeit pre- and posttest scores increasing numerically across groups. Nevertheless, these non-significant results across the different groups may point to the continuing stressors and uncertainty brought about by the pandemic. At the time of this study, many participants were still studying from home as colleges and universities were still closed to on-site classes.

Limitations and implications for future studies

This study utilised a randomised controlled treatment design. However, a limitation was unequal sample sizes. As such, more studies with a similar design using larger samples will provide more robust information on the efficacy and effectiveness of this intervention.

Results showed significant improvements in non-reactivity and a decrease in depression symptoms. Future studies may uncover the specific mechanisms of the intervention that led to these particular outcomes. Both the medium of delivery of the program and program contents may need to be further investigated. There is a need for more understanding as to which active ingredients in the program have the most impact. This information would be useful in determining whether abridged versions of the intervention may be delivered without sacrificing desired outcomes.

The non-significant findings in coping may be due to a number of factors such as a relatively small sample size. Future studies utilising larger samples may enable more robust conclusions. In addition, moderating variables such as preexisting disabilities may be examined. Additionally, future studies may consider measuring the role of the facilitators on the overall experience of the participants. The quality of the relationship and the kind of connectedness that facilitators fostered during the intervention might have played a role in the outcomes of this study as well.

Implications for practice

The use of telepsychology practices has become invaluable from a public mental health perspective. This study presents initial evidence of online synchronous intervention in improving wellbeing, depression and non-reactivity of participants. This bodes well particularly for resource-poor economies that have limited budgets and personnel for mental health services. Scalable interventions such as these may enable access to those who may need mental health psychosocial support.

References

Aller, T. B., *et al.*, (2022) 'A non-randomized, quasi-experimental comparison of effects between an in-person and online delivery of a college mental health literacy curriculum', *Prevention Science*, 23(7):1208–1215. doi: 10.1007/s11121-022-01350-y

Andrews, G., *et al.*, (2010) 'Computer therapy for the anxiety and depressive disorders is effective, acceptable and practical health care: a meta-analysis', *PLoS One,* vol. 5, no. 10, p. e13196. doi: 10.1371/journal.pone.0013196

Andrews, G., *et al.,* (2018) 'Computer therapy for the anxiety and depression disorders is effective, acceptable and practical health care: an updated meta-analysis', *Journal of Anxiety Disorders*, 55, pp. 70–78, doi: 10.1016/j.janxdis.2018.01.001

Ang, W. H. D., *et al.,* (2022) 'Effectiveness of resilience interventions for higher education students: a meta-analysis and meta-regression', *Journal of Educational Psychology*, 114(7), 1670–1694. https://doi.org/10.1037/edu0000719

Antony, M. M., *et al.*, (1998) 'Psychometric properties of the 42-item and 21-item versions of the Depression Anxiety Stress Scales in clinical groups and a community sample', *Psychological Assessment,* vol. 10, no. 2, p. 176. doi: 10.1037/1040-3590.10.2.176

Baer, R., *et al.*, (2006) 'Using self-report assessment methods to explore facets of mindfulness', *Assessment,* vol. 13. no. 1, pp. 27–45. doi: 10.1177/1073191105283504

Blau, I., Weiser, O. & Eshet-Alkalai, Y. (2017) 'How do medium naturalness and personality traits shape academic achievement and perceived learning? An experimental study of face-to-face and synchronous e-learning', *Research in Learning Technology*, 25,1–23. doi: 10.25304/rlt.v25.1974

Browning, M. E., *et al.*, (2022) 'Brief ACT for undergraduates: a mixed-methods pilot investigation of acceptance and commitment therapy delivered over Zoom', *Journal of College Student Psychotherapy*. doi: 10.1080/87568225.2022.2029659

Carver, C. S. (1997) 'You want to measure coping but your protocol's too long: consider the brief COPE', *International Journal of Behavioral Medicine*, vol. 4, no. 1, pp. 92–100. doi: 10.1207/s15327558ijbm0401_6

Constantine, M. G. (2002) 'Predictors of satisfaction with counseling: racial and ethnic minority clients' attitudes toward counseling and ratings of their counselors' general and multicultural counseling competence', *Journal of Counseling Psychology*, vol. 49, no. 2, pp. 255. doi: 10.1037/0022-0167.49.2.255

Giordano, F., *et al.*, (2020) 'Receptive music therapy to reduce stress and improve wellbeing in Italian clinical staff involved in COVID-19 pandemic: a preliminary study', *The Arts in Psychotherapy,* vol. 70, p. 101688. doi: 10.1016/j.aip.2020.101688

Haque, A. (2010) 'Mental health concepts in Southeast Asia: diagnostic considerations and treatment implications', *Psychology, Health and Medicine,* vol. 15*,* pp. 127–134. doi: 10.1080/13548501003615266

Hechanova, M. R. M., *et al.*, (2015) 'The development and initial evaluation of Katatagan: a resilience intervention for Filipino disaster survivors', *Philippine Journal of Psychology,* vol. 48, no. 2, pp. 105–131.

Hechanova, M. R., *et al.*, (2018) 'Evaluation of a resilience intervention for Filipino displaced survivors of Super Typhoon Haiyan', *Disaster Prevention and Management*, vol. 27, no. 3, pp. 346–359. doi: 10.1108/DPM-01-2018-0001

Hechanova, M. R., *et al.*, (2022) 'Online resilience support groups during the COVID-19 pandemic: the Philippine experience', *Mental Health and Social Inclusion,* vol. 26, no. 1, pp. 56–65. doi: 10.1108/MHSI-06-2021-0038

Hechanova, M. R., Valentin, P. & Alampay, K. (2022) 'Age, COVID-19 and mental health in the Philippines: a multi-dimensional perspective', *Asia Pacific Social Science Review,* vol. 22, no. 1, pp. 142–157.

Hechanova, M. R. M., Waelde, L. C. & Ramos, P. A. P. (2016) 'Evaluation of a group-based resilience intervention for Typhoon Haiyan survivors', *Journal of Pacific Rim Psychology,* vol. 10, no. 12, pp. 1–10. doi: 10.1017/prp.2016.9

Imran, N., Zeshan, M. & Pervaiz, Z. (2020) 'Mental health considerations for children & adolescents in COVID-19 pandemic', *Pakistan Journal of Medical Sciences,* vol. 36, no. COVID19-S4, pp. S67–S72. doi: 10.12669/pjms.36.COVID19-S4.2759

Joyce, S., *et al.*, (2018) 'Road to resilience: a systematic review and meta-analysis of resilience training programmes and interventions', *BMJ Open,* vol. 8, pp. 1–9. doi: 10.1136/bmjopen-2017-017858

Li, H., Kraut, R. E. & Zhu, H. (2021) 'Technical features of asynchronous and synchronous community platforms and their effects on community cohesion: a comparative study of forum-based and chat-based online mental health communities', *Journal of Computer-Mediated Communication,* vol. 26, no. 6, pp. 403–421. doi: 10.1093/jcmc/zmab016

Liu, K., *et al.*, (2020) 'Effects of progressive muscle relaxation on anxiety and sleep quality in patients with COVID-19', *Complementary Therapies in Clinical Practice,* vol. 39, p. 101132. doi: 10.1016/j.ctcp.2020.101132

Luthar, S. S. & Cicchetti, D. (2000) 'The construct of resilience: implications for interventions and social policies', *Development and Psychopathology,* vol. 12, no. 4, pp. 857–885. doi: 10.1017/S0954579400004156

Ma, L., *et al.*, (2021) 'Prevalence of mental health problems among children and adolescents during the COVID-19 pandemic: a systematic review and meta-analysis', *Journal of Affective Disorders,* vol. 293, pp. 78–89. doi: 10.1016/j.jad.2021.06.021

Mukhtar, S. (2020) 'Pakistanis' mental health during the COVID-19', *Asian Journal of Psychiatry,* vol. 51, p. 102127. doi: 10.1016/j.ajp.2020.102127

Muthén, L. K. & Muthén, B. O. (1998–2017) *Mplus User's Guide*, 8th edn, Los Angeles, CA: Muthén & Muthén

Muthen, B. O. & Satorra, A. (1995) 'Complex sample data in structural equation modeling', *Sociological Methodology,* vol. 25, pp. 267–316. doi: 10.2307/271070

Peugh, J. L. (2010) 'A practical guide to multilevel modeling', *Journal of School Psychology,* vol. 48, no. 1, pp. 85–112. doi: 10.1016/j.jsp.2009.09.002

Sassaki, Y., *et al.*, (2019) 'Pre-disaster social support is protective for onset of post-disaster depression: prospective study from the Great East Japan earthquake and tsunami', *Nature,* vol. 9, p. 19427. doi: 10.1038/s41598-019-55953-7

Soklaridis, S., *et al.*, (2020) 'Mental health interventions and supports during COVID-19 and other medical pandemics: a rapid systematic review of the evidence', *General Hospital Psychiatry,* vol. 66, pp. 133–146. doi: 10.1016/j.genhosppsych.2020.08.007

Wei, N., *et al.*, (2020) 'Efficacy of internet-based integrated intervention on depression and anxiety symptoms in patients with COVID-19', *Journal of Zhejiang University-SCIENCE B,* vol. 21, no. 5, pp. 400–404. doi: 10.1631/jzus.B2010013

World Health Organization (WHO). (1998) *WHO-5 Well-being Index*. Available at: https://www.psykiatri-regionh.dk/who-5/Pages/default.aspx

Zhou, L., *et al.*, (2020) 'Feasibility and preliminary results of effectiveness of social media-based intervention on the psychological well-being of suspected COVID-19 cases during quarantine', *The Canadian Journal of Psychiatry,* vol. 65, no. 10, pp. 736–738. doi: 10.1177/0706743720932041